AMENDMENTS TO THE CLAIMS

Listing of the claims:

Following is a listing of all claims in the present application, which listing supersedes all previously presented claims:

1. (Currently Amended) An exhaust gas purifying apparatus for an internal combustion engine comprising:

a NOx selective reduction catalyst disposed in an exhaust passage of said internal combustion engine for purifying NOx in exhaust gases flowing through said exhaust passage under the existence of a reducing agent;

a NOx detector disposed in said exhaust passage ~~pipe~~ at a location downstream of said NOx selective reduction catalyst for detecting a NOx concentration in exhaust gases;

a reducing agent supply unit for supplying the reducing agent to said NOx selective reduction catalyst;

exhaust gas volume detecting means for detecting an exhaust gas volume of said internal combustion engine;

basic supply amount determining means for determining a basic supply amount of the reducing agent to said NOx selective reduction catalyst in accordance with the detected exhaust gas volume;

estimated value calculating means for calculating an estimated value of a detected value detected by said NOx detector on the basis of a model indicative of a relationship between the estimated value and a correction coefficient for correcting the basic supply amount of the reducing agent; and

supply amount determining means for determining an ~~the~~ amount of the reducing agent supplied to said NOx selective reduction catalyst by said reducing agent supply unit by determining the correction coefficient on the basis of said model such that the ~~NOx concentration detected by said NOx detector~~ estimated value reaches an extreme value.

2. (Currently Amended) An exhaust gas purifying apparatus for an internal combustion engine according to claim 1, further comprising[[:]]

an upstream NOx detector disposed in said exhaust passage at a location upstream of said NOx selective reduction catalyst for detecting the NOx concentration in exhaust gases~~; and~~

~~exhaust gas volume detecting means for detecting an exhaust gas volume of said internal combustion engine~~,

wherein said ~~supply amount determining means includes:~~

basic supply amount determining means determines the ~~for determining a~~ basic supply amount ~~of the reducing agent to said NOx selective reduction catalyst~~ in accordance with the NOx concentration detected by said upstream NOx detector and the detected exhaust gas volume~~; and~~

~~correcting means for correcting said determined basic supply amount of the reducing agent such that the NOx concentration detected by said NOx detector reaches an extreme value~~.

3. (Original) An exhaust gas purifying apparatus for an internal combustion engine according to claim 1, further comprising a reducing agent production unit for producing the reducing agent using at least a fuel for said internal combustion engine as a raw

material.

4. (Original) An exhaust gas purifying apparatus for an internal combustion engine according to claim 3, wherein said reducing agent is ammonia.

5. (Currently Amended) An exhaust gas purifying method for an internal combustion engine comprising the steps of:

purifying NOx in exhaust gases flowing through an exhaust passage using a NOx selective catalyst under the existence of a reducing agent;

detecting a NOx concentration in exhaust gases;

supplying the reducing agent to a NOx selective reduction catalyst;

detecting an exhaust gas volume of said internal combustion engine;

determining a basic supply amount of the reducing agent to said NOx selective reduction catalyst in accordance with the detected exhaust gas volume;

calculating an estimated value of a detected value detected by said NOx detector on the basis of a model indicative of a relationship between the estimated value and a correction coefficient for correcting the basic supply amount of the reducing agent; and

determining the amount of the reducing agent supplied to said NOx selective reduction catalyst by determining the correction coefficient on the basis of said model such that the estimated value ~~detected NOx concentration~~ reaches an extreme value.

6. (Currently Amended) An exhaust gas purifying method for an internal combustion engine according to claim 5, further comprising the step ~~steps~~ of[[:]]

detecting the NOx concentration in exhaust gases in said exhaust passage at a location upstream of said NOx selective reduction catalyst~~; and~~

~~detecting an exhaust gas volume of said internal combustion engine~~,

wherein said step of determining the ~~amount of the reducing agent includes: determining a~~ basic supply amount ~~of the reducing agent to said NOx selective reduction catalyst~~ is performed in accordance with the NOx concentration detected at the location upstream of said NOx selective reduction catalyst and the detected exhaust gas volume~~; and~~

~~correcting said determined basic supply amount of the reducing agent such that the detected NOx concentration reaches an extreme value~~.

7. (Original) An exhaust gas purifying method for an internal combustion engine according to claim 5, further comprising the step of producing the reducing agent using at least a fuel for said internal combustion engine as a raw material.

8. (Original) An exhaust gas purifying method for an internal combustion engine according to claim 7, wherein said reducing agent is ammonia.

9. (Currently Amended) An engine control unit including a control program for causing a computer to execute an exhaust gas purifying method for an internal combustion engine,

wherein said control program causes the computer to instruct an exhaust gas purifying apparatus to purify NOx in exhaust gases flowing through an exhaust passage under the existence of a reducing agent; instruct a NOx sensor to detect a NOx concentration in exhaust gases; instruct a reducing agent supply unit to supply the reducing agent to a NOx selective reduction catalyst; instruct exhaust gas volume detecting means to detect an exhaust gas volume of said internal combustion engine; determine a basic supply amount of the reducing agent to said NOx selective reduction

catalyst in accordance with the detected exhaust gas volume; instruct estimated value calculating means to calculate an estimated value of a detected value detected by said NOx sensor on the basis of a model indicative of a relationship between the estimated value and a correction coefficient for correcting the basic supply amount of the reducing agent; and determine the amount of the reducing agent supplied to said NOx selective reduction catalyst by determining the correction coefficient on the basis of said model such that the estimated value ~~detected NOx concentration~~ reaches an extreme value.

10. (Currently Amended) An engine control unit according to claim 9, wherein said control program further causes the computer to instruct an upstream NOx sensor to detect the NOx concentration in exhaust gases a location upstream of said NOx selective reduction catalyst~~; instruct exhaust gas volume detecting means to detect an exhaust gas volume of said internal combustion engine;~~ and determine the ~~a~~ basic supply amount ~~of the reducing agent to said NOx selective reduction catalyst~~ in accordance with the NOx concentration detected at the location upstream of said NOx selective reduction catalyst and the detected exhaust gas volume~~; and correct said determined basic supply amount of the reducing agent such that the detected NOx concentration reaches an extreme value~~.

11. (Original) An engine control unit according to claim 9, wherein said control program further causes the computer to instruct a reducing agent production unit to produce the reducing agent using at least a fuel for said internal combustion engine as a raw material.

12. (Original) An engine control unit according to claim 11, wherein said reducing agent is ammonia.

13. (New) An engine control unit according to claim 9, wherein said model indicates a relationship between the estimated value and the correction coefficient determined before a dead time, which is a time taken by exhaust gasses discharged from said internal combustion engine to reach said NOx detector.

14. (New) An engine control unit according to claim 9, wherein said control program further causes the computer to instruct an identifying means in said estimated value calculating means to identify a mode parameter of said model by a least square method such that the estimated value converges to the detected value of said NOx detector.

15. (New) An exhaust gas purifying apparatus for an internal combustion engine according to claim 1, wherein said model is one indicative of a relationship between the estimated value and the correction coefficient determined before a dead time, which is a time taken by exhaust gasses discharged from said internal combustion engine to reach said NOx detector.

16. (New) An exhaust gas purifying apparatus for an internal combustion engine according to claim 1, wherein said estimated value calculating means includes identifying means for identifying a mode parameter of said model by a least square method such that the estimated value converges to the detected value of said NOx detector.

17. (New) An exhaust gas purifying method for an internal combustion engine according to claim 5, further comprising said model indicating a relationship between the estimated value and the correction coefficient determined before a dead time, which

is a time taken by exhaust gasses discharged from said internal combustion engine to reach said NOx detector.

18. (New) An exhaust gas purifying method for an internal combustion engine according to claim 5, wherein said step of calculating an estimated value includes identifying a mode parameter of said model by a least square method such that the estimated value converges to the detected value of said NOx detector.